

converting the sensed output voltage to an indication of the applied force, and wherein only when the sensed output voltage exceeds a voltage threshold level does the integrated device act as the haptic feedback device by, halting the sensing of the output voltage by the controller unit, activating the mechanical actuator by the controller unit, and imparting a physical force to the touch sensitive surface by the activated mechanical actuator.

14. The device as recited in claim **13**, wherein the imparted physical force creates a vibro-tactile response felt by the user commensurate with the physical force applied by the user on the touch sensitive surface.

15. An integrated method for both sensing a force applied to a touch sensitive surface and providing a haptic feedback response to the sensed force by an integrated device having a controller unit coupled to the touch sensitive surface and a mechanical actuator, comprising:

wherein the integrated device senses the applied force by, generating an output voltage in direct proportion to the force applied to the mechanical actuator, sensing the output voltage by the controller unit, and converting the sensed output voltage to an indication of the applied force; and wherein the integrated device provides the haptic feedback response by, if the sensed output voltage exceeds a voltage threshold level, then halting the sensing of the output voltage by the controller unit, activating the mechanical actuator by the controller unit, and imparting a physical force to the touch sensitive surface by the activated mechanical actuator.

16. The method as recited in claim **15**, wherein the imparted physical force creates a vibro-tactile response felt by the user commensurate with the physical force applied by the user on the touch sensitive surface.

17. The method as recited in claim **15**, wherein the mechanical actuator operatively coupled to the touch sensitive surface is arranged to provide a specific type of tactile feedback corresponding to the amount of pressure applied to the touch sensitive surface by the user.

18. An electronic device, comprising:
a touch pad having a touch sensitive surface arranged to process a user touch event; and
a plurality of haptic feedback devices each of which is operatively coupled to the touch sensitive surface and

each responding to the user touch event only in a specific region of the touch sensitive surface and arranged to provide tactile feedback singly or in combination with others of the plurality of haptic feedback devices in response to the user touch event.

19. The electronic device as recited in claim **18**, wherein when the touch sensitive regions of at least two of the plurality of haptic devices overlap and if the user touch event occurs in the overlapping region, then the at least two haptic devices cooperate to provide a combined haptic feedback response.

20. The electronic device as recited in claim **19**, wherein the combined haptic feedback response includes a first component associated with one of the at least two haptic devices and a second component associated with the other of the at least two haptic devices.

21. The electronic device as recited in claim **20**, wherein the first component is related to a distance from the user touch event to the one of the at least two haptic devices.

22. The electronic device as recited in claim **20**, wherein the second component is related to a distance from the user touch event to the other of the at least two haptic devices.

23. The electronic device as recited in claim **20**, wherein the first and the second components combine linearly to form the compound haptic response.

24. An electronic device, comprising:

a touch pad having a touch sensitive surface arranged to receive a user touch event provided by a user;
a controller coupled and in communication with the touch pad arranged to at least analyze the user touch event and/or a state of the touch pad and based upon the analysis provide a user touch event signal in response to the user touch event; and

at least one haptic device operatively coupled to the controller arranged to receive the user touch event signal, wherein the at least one haptic device responds to the user touch event signal by providing an appropriate haptic feedback response to the user based upon the analysis provided by the controller.

25. The electronic device as recited in claim **24**, wherein the touch sensitive surface is arranged to receive different types of user touch events each being characterized by an amount of pressure applied on the touch sensitive surface by a user.

26. The electronic device as recited in claim **25**, wherein the haptic device responds to the user touch event based upon the applied pressure.

* * * * *